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## Custom Log

<b>COMPANY</b>	Encana Oil and Gas (USA)
<b>WELL</b>	Stewart 36-1H
<b>FIELD</b>	Plateau
<b>REGION</b>	Piceance Basin
<b>COORDINATES</b>	N 39 13' 34.900" W 108 3' 37.150"
<b>ELEVATION</b>	5964' GL 5986' KB
<b>COUNTY, STATE</b>	Mesa, Colorado
<b>API INDEX</b>	05-077-10100-00
<b>SPUD DATE</b>	04/15/2011
<b>CONTRACTOR</b>	Nabors Drilling
<b>CO. REP.</b>	Charlie Brown
<b>RIG/TYPE</b>	M13 Rotary Triple/ Top Drive
<b>LOGGING UNIT</b>	ML 0035
<b>GEOLOGISTS</b>	Jim Sadler Phillip Kelley-Dotson
<b>ADD. PERSONS</b>	
<b>CO. GEOLOGIST</b>	Erik Graven

### LOG INTERVAL

**DEPTHS:** 3400' **TO** 13202'

**DATES:** 04/19/2011 **TO** 05/15/2011

**SCALE:** 1"=100'

### CASING DATA

20" **AT** 40'

10.75" **AT** 1427'

7.625" **AT** 6558'

4.5" **AT**

### MUD TYPES

Water Based **TO** 13202'

**TO**

**TO**

**TO**

### HOLE SIZE

24" **TO** 40'

12.25" **TO** 1457'

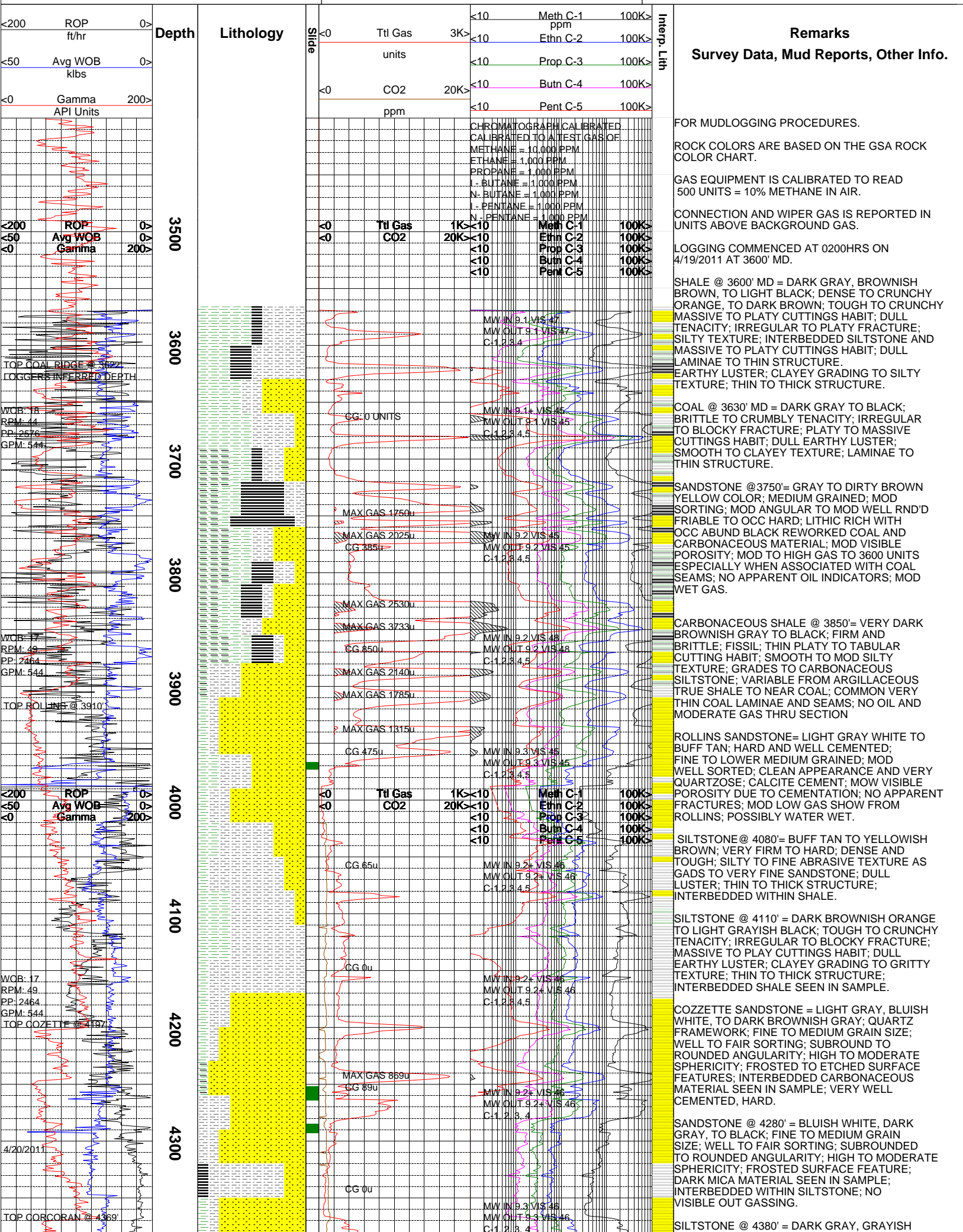
9.875" **TO** 6580'

6.5" **TO** 13202'

### ABBREVIATIONS

<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</i> MUD RESISTIVITY	<i>SG</i> SURVEY GAS
<i>PP</i> PUMP PRESSURE	<i>Rmf</i> FILTRATE RESISTIVITY	<i>WG</i> WIPER GAS
<i>SPM</i> STROKES/MIN	<i>PR</i> POOR RETURNS	<i>CG</i> CONNECTION GAS
<i>MW</i> MUD WEIGHT	<i>LAT</i> LOGGED AFTER TRIP	
<i>VIS</i> FUNNEL VISCOSITY	<i>LAS</i> LOGGED AFTER SURVEY	

ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION	CLAY-MUDSTONE	GRANITE WASH	PHOSPHATE	SHALE TUFFACEOUS
BRECCIA	CLYST-TUFFACEOUS	GRANODIORITE	PORCELANITE	SHELL FRAGMENTS
CALCARENITE	CHLORITIZATION	GYPSUM	PORCELANEOUS CLYST	SIDERITE
CALCAREOUS TUFF	COAL	HALITE	PYRITE	SILICIFICATION
CALCILUTITE	CONGLOMERATE	HORNBL-QTZ-DIO	PYROCLASTICS	SILTSTONE
CARBONATES	CONGL. SAND	IGNEOUS (ACIDIC)	QUARTZ DIORITE	SILTST-TUFFACEOUS
CARBONACEOUS MAT	CONGL. SANDSTONE	IGNEOUS (BASIC)	QUARTZ LATITE	TUFF
CARBONACEOUS SH	COQUINA	INTRUSIVES	QUARTZ MONZONITE	VOLCANICLASTICS SEDS
CEMENT CONTAM.	DACITE	KAOLINITIC	RECRYSTALLIZED CALCITE	VOLCANICS
CHALK	DIATOMITE	LIMESTONE	RHYOLITE	
CRYSTALLINE TUFF	DIORITE	LITHIC TUFF	SALT	
CHERT - ARGILL	DOLOSTONE	MARL - DOLO	SAND	



NOV 11 9:17:51 AM @ 4389

WOB: 13  
RPM: 51  
PP: 1803  
GPM: 418  
ROP  
Avg WOB  
Gamma

WOB: 8  
RPM: 51  
PP: 1985  
GPM: 520

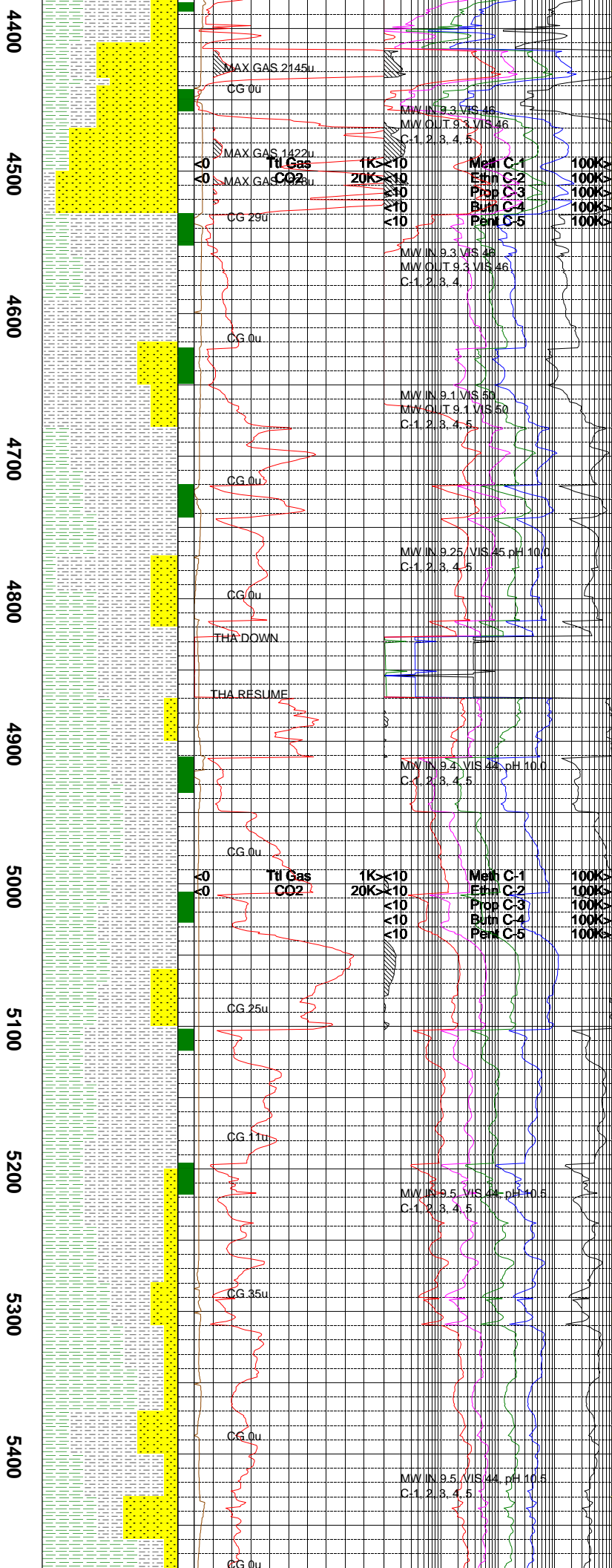
WOB: 7k  
RPM: 2 + MOTOR  
PP: 1589  
GPM

ROP  
Avg WOB  
Gamma

TOP BUCK TONGUE MANCOS  
@ 5102

WOB: 4-11k  
RPM: 46 + MOTOR  
PP: 1681  
GPM

WOB: 5-7k  
RPM: 46 + MOTOR  
PP: 1681  
GPM



RED PURPLE TO BROWNISH BLACK; TOUGH TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; SILTY GRADING TO GRITTY TEXTURE; THIN TO THICK STRUCTURE; SOME INTERBEDDED SAND IN SAMPLE.

SANDSTONE @ 4460' = BLUISH WHITE, GRAYISH WHITE; SALT AND PEPPER APPEARANCE; PREDOMINANTLY QUARTZ FRAMEWORK; DARK MICA MATERIAL PRESENT; FINE TO MEDIUM GRAIN SIZE; FAIR TO POOR SORTING; SUBROUNDED TO SUBANGULAR; MODERATE TO LOW SPHERICITY; FROSTED AND ETCH SURFACE FEATURES; QUARTZ WITH TRACE CALCITE CEMENT.

SILTSTONE @ 4560' = DARK GRAY, GRAYISH RED PURPLE TO BROWNISH BLACK; TOUGH TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; SILTY GRADING TO GRITTY TEXTURE; THIN TO THICK STRUCTURE.

SILTSTONE @ 4630' = DARK GRAY, BROWNISH BLACK; TOUGH, CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; DULL EARTHY LUSTER; SILTY GRADING TO GRITTY TEXTURE; THIN TO THICK STRUCTURE.

SILTSTONE @ 4700' = DARK GRAY, BROWNISH BLACK; TOUGH, CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; DULL EARTHY LUSTER; SILTY GRADING TO GRITTY TEXTURE; THIN TO THICK STRUCTURE; GRADING FROM SHALE TO A VERY FINE CLAYEY SANDSTONE; MODERATE DRILL GAS THRU SECTION.

SHALE = MEDIUM TO DARK GRAY TO MEDIUM BROWN GRAY; VERY FIRM AND BRITTLE; SLI CRUNCHY; NON TO SLI CALCAREOUS; POSS SLI SILICIC PER CRUNCHY NATURE; THINLY BEDDED AND MOD FISSIL; INTERBEDDED THINLY WITH SILTSTONES; OCC SMALL BLACK TO VERY DARK BROWN FOSSIL FRAGMENTS; NO OIL INDICATORS; MODERATE DRILL GAS WITH C-1 THRU C-5 PRESENT.

SILTSTONE = MEDIUM TO DARK GRAY TO BROWN GRAY; VERY FIRM TO MOD HARD; SILTY TO FINE ABRASIVE TEXTURE; BRITTLE TO TO CRUNCHY; SMALL BLOCKY TO TABULAR CUTTING HABIT; NON TO SLI CALCAREOUS; DULL TO SLI RESINOUS LUSTER; HACKLY TO PLANAR FRACTURE; GRADING TO VERY FINE DENSE CLAYEY SANDSTONE IN PART; NO FRACTURE EVIDENCE; VARIABLE FISSIL; NO OIL INDICATORS; MODERATE GAS THRU SECTION.

SANDSTONE = VERY FINE GRAINED; BROWNISH GRAY COLOR; DENSE AND VERY WELL CEMENTED WITH NO TO VERY SMALL VISIBLE POROSITY NO APPARENT FRACTURES; QUARTZOSE; MOD WELL ROUNDED; SILICA CEMENT; MOD SORTED; THIN BEDS WITHIN SHALE/SILT SECTION; GRADING TO AND FROM SILTSTONE; HARD AND WELL CEMENTED; NO OIL INDICATOR MINOR INCREASE IN GAS COMPARED TO REST OF SECTION FROM SANDSTONES.

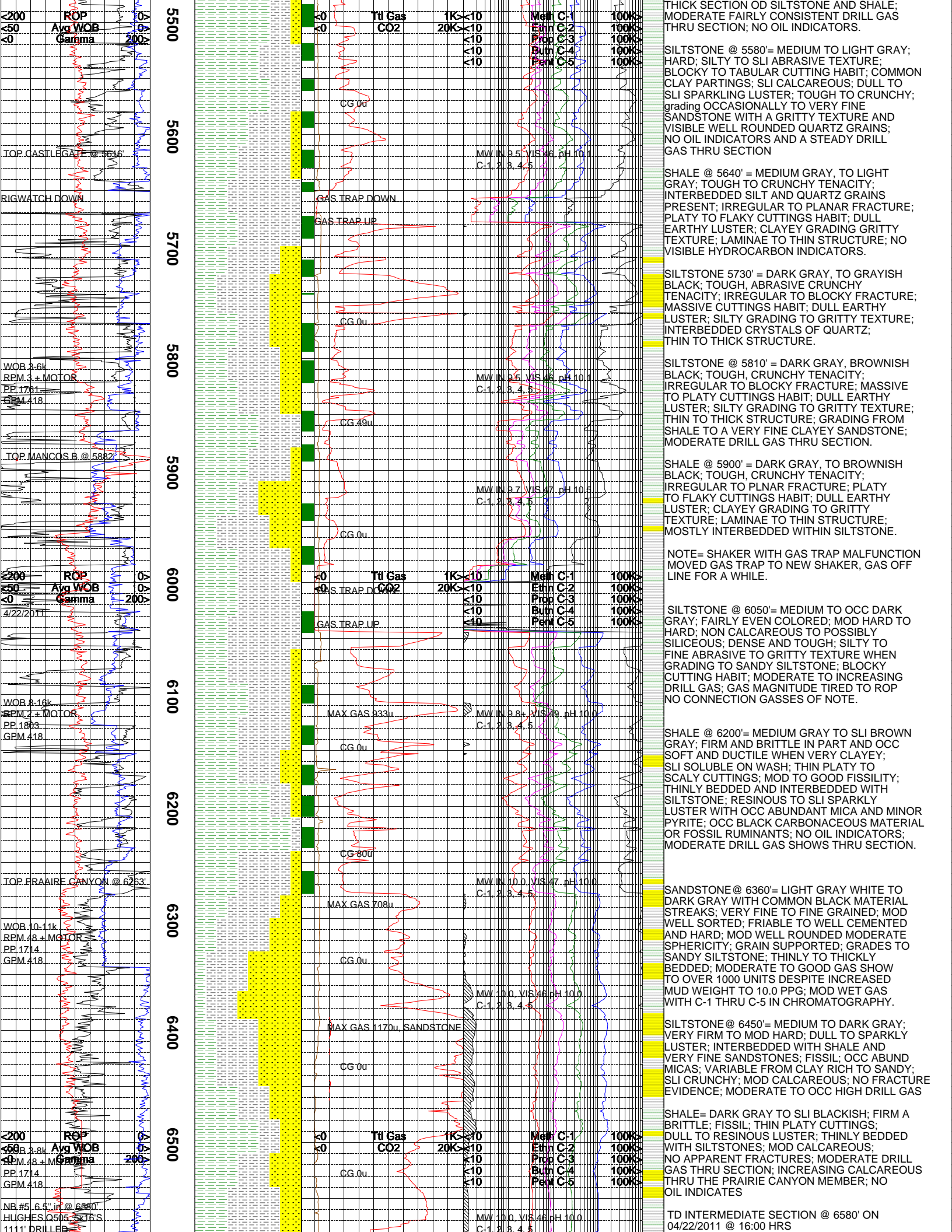
SHALE @ 5200' = MEDIUM GRAY WITH BROWN HUES; FIRM TO SLI HARD; INCREASINGLY ARGILLACEOUS AND LESS CRUNCHY; SLI SOLUBLE ON WATER WASH GIVING CLOUDY WATER NON CALCAREOUS; THIN PLATY CUTTINGS; FISSIL; THINLY BEDDED TO LAMINATED; COMMON SHALE PARTINGS; GRADES TO SILTSTONE IN PART; DULL EARTHY LUSTER; DRIES TO LIGHT GRAY BUFF COLOR; MODERATE ROP DEPENDENT DRILL GAS; NO OIL INDICATORS.

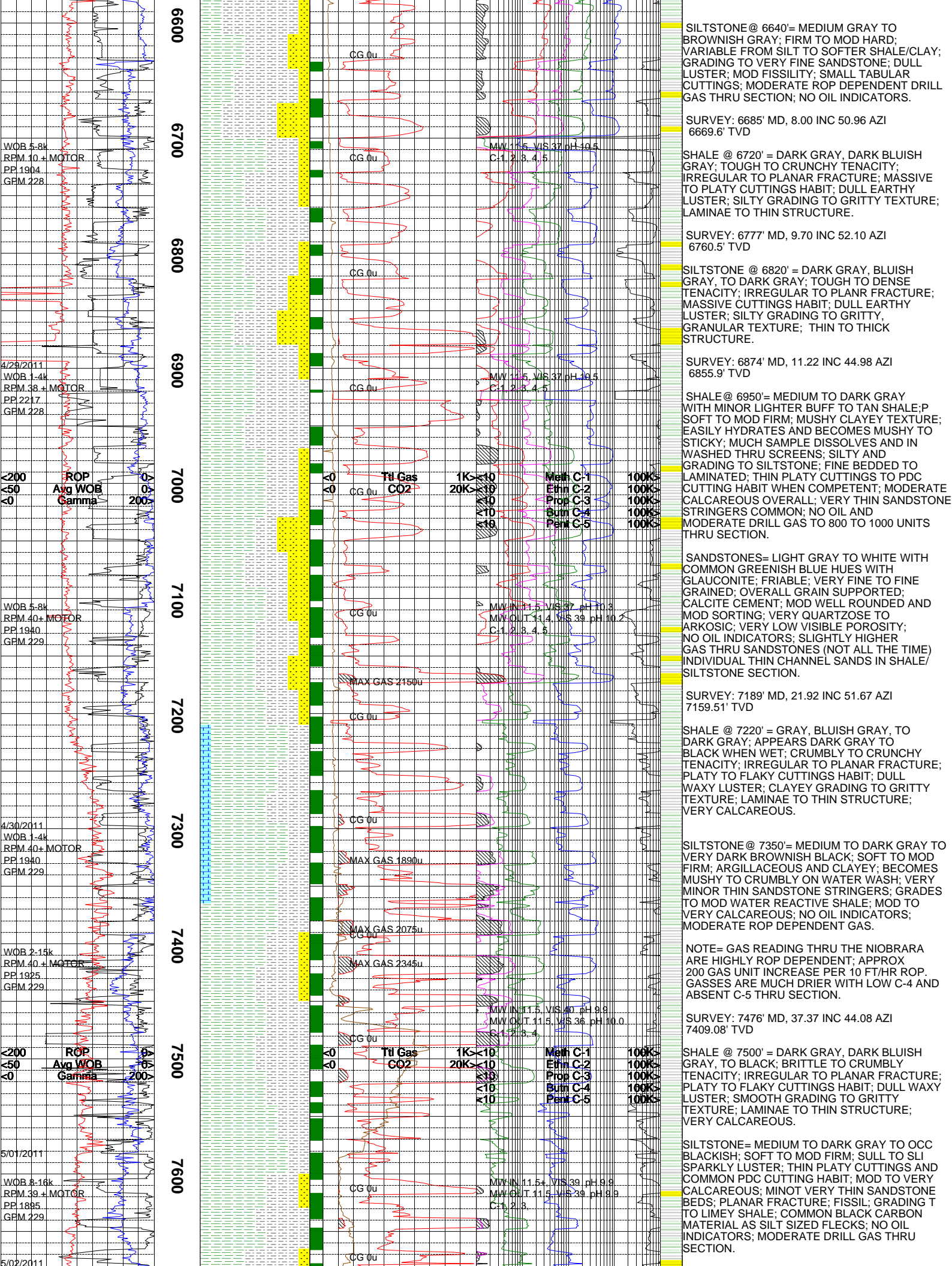
SANDSTONE @ 5310' = WHITE TO LIGHT GRAY; LOWER MEDIUM GRAINED; WELL SORTED; FRIABLE TO SLI HARD; GRAIN SUPPORTED; VERY QUARTZOSE; MODERATE TO LOW VISIBLE POROSITY; SILICA AND CALC CEMENT; DULL TO MOD YELLOW FLUORESCENCE; NO CUT NOR PETRO ODOR; MODERATE GAS THRU SECTION SANDSTONES ARE THIN BEDS WITHIN SHALE SECTION.

NOTE = GAS READINGS ARE PRIMARILY DRILL GAS AND ARE HIGHLY ROP DEPENDANT; VERY SMALL TO ABSENT CONNECTION GASSES SHOW VERY LITTLE TO NO GAS BLEED IN WHILE PUMPS OFF;

SHALE @ 5430' = MEDIUM GRAY WITH MINOR BROWN HUES; FIRM TO OCC HARD; DULL TO MOD RESINOUS LUSTER; SMOOTH CLAYEY TO OCC SILTY TEXTURE; CRUMBLY; FISSIL WITH THIN PLATY TO SCALY CUTTINGS DOMINANT; SLIGHTLY CALCAREOUS; CLAYS SLI SOLUBLE ON WATER WASHING; GRADES TO SILTSTONE;

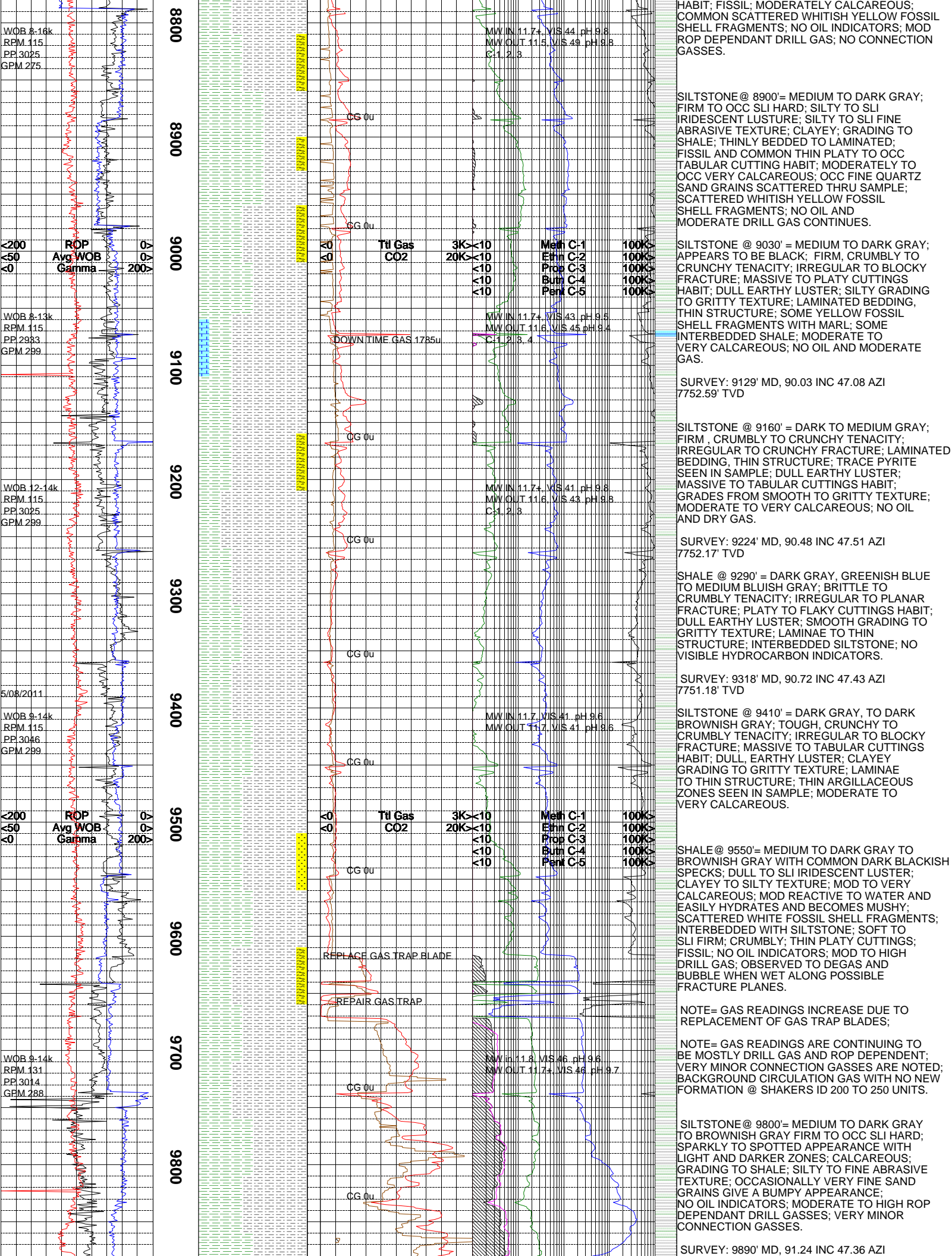


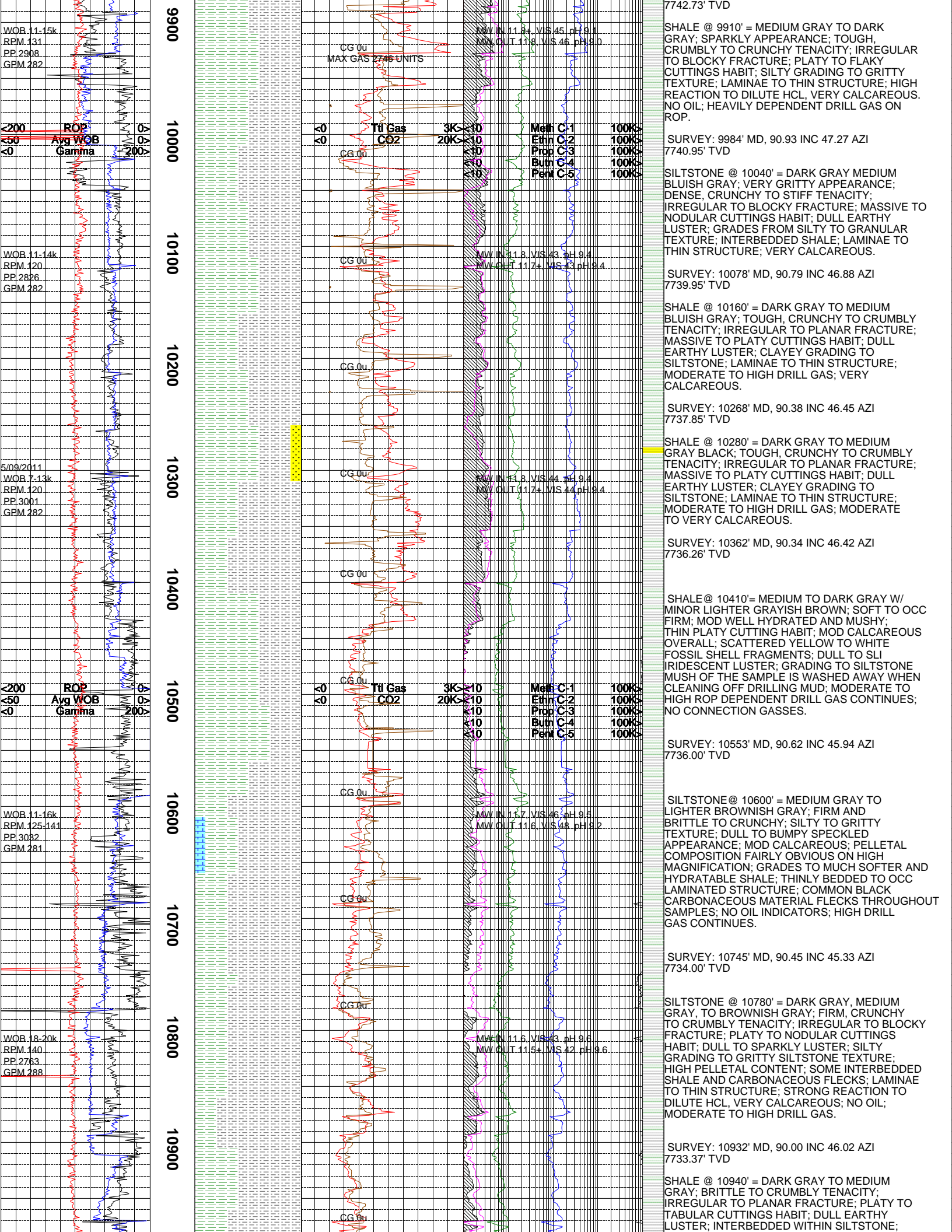




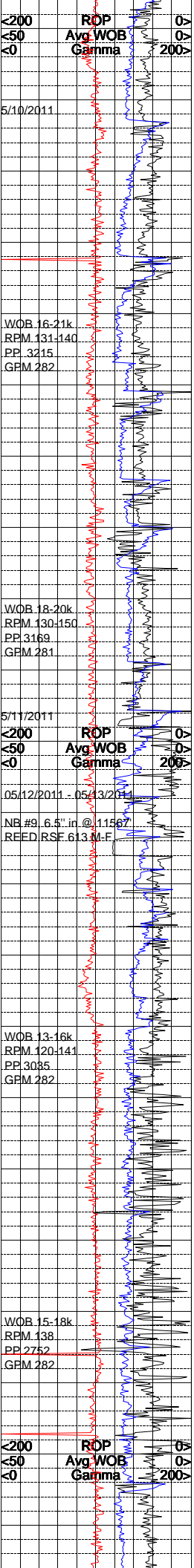


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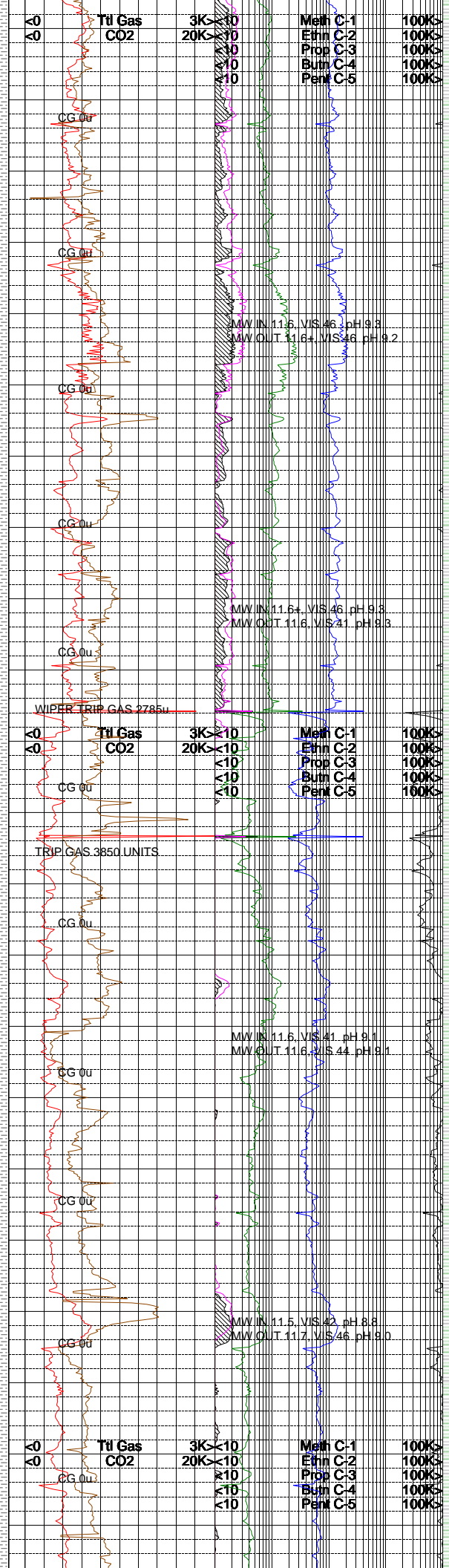








11000  
11100  
11200  
11300  
11400  
11500  
11600  
11700  
11800  
11900  
12000



CLAYEY GRADING TO GRITTY TEXTURE;  
LAMINAE STRUCTURE; NO OIL INDICATORS;  
MODERATE TO HIGH DRILL GAS.

SILTSTONE @ 11100' = MEDIUM BROWNISH GRAY  
TO GRAY; FIRM TO OCC BRITTLE AND SLIGHT  
HARD; CRUMBLY TO CRUNCHY; BUMPY TO  
SLI IRIDESCENT APPEARANCE; MOD  
ARGILLACEOUS; CALCAREOUS; SMALL PLATY  
CUTTINGS HEAVILY REWORKED IN LATERAL  
SECTION; GRADING TO SOFTER SHALE  
AND OCC VERY FINE SAND GRAINS SEEN;  
NO OIL AND MODERATE DITCH GAS CONTINUES.

SHALE @ 11160' = MEDIUM GRAY TO OCC GRAY  
BLACK; DRIES TO A LIGHTER BROWNISH GRAY;  
SOFT TO SLI FIRM; EASILY HYDRATABLE AND  
MUSHY; PDC CORRELATED TO THIN PLATY  
CUTTING HABIT WHEN MORE COMPETENT;  
THINLY BEDDED AND FISSIL; INTERBEDDED  
WITH SILTSTONE; SCATTERED BLACK CARBON  
MATERIAL FLECKS; SMOOTH TO SLI  
SILTY TEXTURE; MODERATELY CALCAREOUS;  
OCC WHITISH YELLOW FOSSIL SHELL  
FRAGMENTS; NO OIL AND DITCH GAS IS  
HIGHLY ROP DEPENDENT.

SILTSTONE @ 11360' = MEDIUM GRAY TO DARK  
GRAY WITH BROWN HUES; FIRM; SILTY TO  
FINE ABRASIVE TEXTURE; BRITTLE AND SLI  
CRUNCHY; MOD CALCAREOUS; MOD CLAYEY  
AND CLAY WASHES OUT IN WATER; DULL TO  
OCC SPARKLY TO SLI IRIDESCENT LUSTER;  
PELLETAL SILTSTONE OBSERVED AS BUMPY  
APPEARANCE WITH DARK GRAY BLACK PELLETS  
IN LIGHTER GRAY MATRIX; SEEN TO DEGAS  
SLIGHTLY UNDER WATER; POSSIBLE  
SECONDARY FRACTURE POROSITY; NO  
OIL INDICATORS.

SURVEY: 11407' MD, 90.00 INC 48.85 AZI  
7734.00' TVD

SHALE @ 11450' = MEDIUM GRAY TO DARK  
GRAY; TOUGH, CRUMBLY TO CRUNCHY  
TENACITY; IRREGULAR TO PLANAR FRACTURE;  
PLATY TO FLAKY CUTTINGS HABIT; DULL  
EARTHY LUSTER; CLAYEY GRADING TO  
GRITTY SILTSTONE TEXTURE; LAMINAE  
STRUCTURE; MODERATE TO HIGH REACTION  
TO DILUTE HCL, VERY CALCAREOUS; SOME  
THIN INTERBEDDED CARBONACEOUS MATERIAL;  
NO OIL; MODERATE GAS DEPENDENT ON ROP.

NOTE= POOH @ 11567' FOR A NEW BIT.

SILTSTONE= VERY DARK GRAY TO GRAY; DRIES  
SOMEWHAT LIGHTER; FIRM TO SLI HARD;  
CRUNCHY TO CRUMBLY; MODERATELY  
CALCAREOUS; DULL TO SPARKLY LUSTER;  
BUMPY PELLATAL APPEARANCE IN SOME  
CUTTINGS; GRADING TO MORE ARGILLACEOUS  
SHALE; HACKLY TO PLANAR FRACTURE; VERY  
THINLY BEDDED TO LAMINATED STRUCTURE;  
FISSIL; THIN PLATY TO MODERATELY  
REWORKED IRREGULAR CUTTING HABIT;  
OCC SEEN TO SLOWLY DEGAS IN WET  
SAMPLE TRAY; MODERATE TO HIGH ROP  
DEPENDENT DRILL GAS; GAS IS DRY WITH  
VERY LOW C-3 AND TRACE C-4 IN  
CHROMATOGRAPHY.

SHALE @ 11800' = MEDIUM TO DARK GRAY TO  
OCC BLACKISH IN NATURAL SUNLIGHT;  
FIRM TO OFF SOFT AND MUSHY; MOD  
SILTY OVERALL; OBSERVED TO BE SOLUBLE  
ON WATER WASHING; GENERALLY MODERATE  
CALCAREOUS; VERY THINLY BEDDED AND  
GRADING TO AND INTERBEDDED WITH SILTST;  
MODERATE TO OCC HIGH DRILL GAS; NO  
APPARENT CONNECTION GASSES; NO OIL  
INDICATORS,

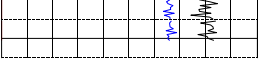
NOTE= GASSES CONTINUE TO BE DRY AND  
DEPENDENT ON ROP AS TO MAGNITUDE. THERE  
ARE NO APPARENT CONNECTION GASSES.

SURVEY: 11887' MD, 91.75 INC 48.66 AZI  
7729.00' TVD

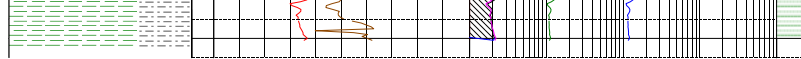
SHALE @ 11940' = DARK GRAY, TO MEDIUM  
GREENISH GRAY; TOUGH, CRUNCHY TO  
CRUMBLY TENACITY; IRREGULAR TO PLANAR  
FRACTURE; PLATY TO FLAKY CUTTINGS HABIT;  
EARTHY, DULL TO WAXY LUSTER WHEN WET;  
CLAYEY GRADING TO GRITTY TEXTURE;  
LAMINAE TO THIN STRUCTURE; INTERBEDDED  
SILTSTONE; MODERATE TO HIGH REACTION TO  
DILUTE HCL, MODERATELY CALCAREOUS; NO  
OIL; DRY GAS.

SURVEY: 12078' MD, 91.82 INC 47.26 AZI  
7722.85' TVD





13201



NOTE= TD 13202' REACHED AT 14:45 HRS ON  
05/15/2011

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